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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

DATSKOVSKIY, MICHAEL V

ART UNIT PAPER NUMBER

2835

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/19/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/683,924

Applicant(s)

SAUCIUC ET AL.

Examiner

Michael V. Datskovskiy

Art Unit

2835

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 March 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4-8 and 21-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4-8, 21-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) ☐ Notice of References Cited (PTO-892) | 4) ☐ Interview Summary (PTO-413) |
| 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) ☐ Information Disclosure Statement(s) (PTO/SB/08) | 5) ☐ Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) ☐ Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 03/27/2007 have been fully considered but they are not persuasive. Examiner disagrees with the applicant's statement that there is no suggestion in Meir that: "power to the thermoelectric module is limited and fan speed is accelerated when power to the thermoelectric module reaches a predetermined maximum value". Meir in paragraph [0051] discloses that: "Preferably, the method further comprises the step of operating at least one computer case fan at a substantially lower duty cycle and therefore voltage, thereby reducing fan speed and consequently, noise emission levels still further." Meir in paragraphs [0052] and [0056] discloses: "Optionally, the method further comprises the steps of sampling data from the processor temperature sensor; determining whether the sampled data is within a preselected acceptable range, and if said data is higher than the preselected range, setting a PWM signal output from the microprocessor to maximum (about 100% PWM) to operate the thermoelectric element(s) at maximum power; and operating the processor cooling fan at maximum speed for maximum cooling of the processor". Examiner interprets the above as following: First: With regard to the speed of the fan: Preferably fan has a lower speed, but sometimes, based on the steps of sampling data from the processor temperature sensor; determining whether the sampled data is within a preselected acceptable range, and if said data is higher than the preselected range, the speed of the fan is accelerated (for maximum), which matches the requirement of the claim 21. Second: With respect to the power to the thermoelectric module: By Meir: "... the

method further comprises the steps of sampling data from the processor temperature sensor; determining whether the sampled data is within a preselected acceptable range, and if said data is higher than the preselected range, setting a PWM signal output from the microprocessor to maximum (about 100% PWM) to operate the thermoelectric element(s) at maximum power". Applicant argues that: "Meir does not disclose the feature as illustrated in Figure 2, Claim 21 specifically includes the limitation that "power to the thermoelectric module is limited and fan speed is accelerated when power to the thermoelectric module reaches a predetermined maximum value." Claim 21 thus includes at least one limitation that is not suggested by Meir". From Examiner's point of view Meir teaches exactly what claim 21 requires: Fan's speed is accelerated, based on the input from the controller controlling the power provided to the thermoelectric module and the speed of the fan, while the power to the thermoelectric module is limited by reaching its maximum value. It looks that applicant has to clarify claim 21, because right now it claims that: "power to the thermoelectric module is limited and fan speed is accelerated when power to the thermoelectric module reaches a predetermined maximum value", which is clearly disclosed by Meir. Therefore, the previous rejection stays.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the

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applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 21 and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Meir (US Patent Application Publication 2005/0174737 A1).

: Meir teaches a computer system, Fig. 5, comprising: a microelectronic die 319 having an integrated circuit formed therein; a thermoelectric module 318 thermally coupled to the microelectronic die 319 so as to pump heat from the microelectronic die when current is provided to the thermoelectric module 318; a cold side plate 317; a hot side plate (heat sink) 315; a cold-side temperature sensor 320 at one side of the thermoelectric module; and a controller 322 connected to the temperature sensor 320 to receive an indication of temperature at the temperature sensor 320 as an input into the controller 322, the controller 322 controlling the current provided to the thermoelectric module based on the input. Meir teaches furthermore the computer system of claim 1, further comprising: an ambient temperature sensor 324 detecting ambient temperature of air distant from the microelectronic die 319 and the thermoelectric module 318, the controller being connected to the ambient temperature sensor 324 to receive an indication of temperature at the ambient temperature sensor 324, the controller 322 controlling current provided to the thermoelectric module 318 based on an input from the ambient temperature sensor 324. Meir teaches furthermore the computer system further comprising: a fan 314 inherently provided with a motor coupled to the fan to rotate the fan so that the fan cools the microelectronic die 319 when power is provided to the motor, the controller controlling power provided to the motor such that power to

the thermoelectric module is limited and fan speed is accelerated when power to the thermoelectric module reaches a predetermined maximum value (paragraphs [0052]; and [0056]).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 22, 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meir in view of Atkinson (US Patent Application Publication 2005/0204747 A1). Meir teaches all the limitations of the claims except the computer system of claim 1, further comprising: a vapor chamber between the microelectronic die and the thermoelectric module; and a fluid in the vapor chamber, the fluid being evaporated when heat transfers thereto from the microelectronic die and condensing when heat transfers therefrom to the thermoelectric module. Atkinson teaches a thermoelectrically cooling electronic device 10, Fig. 6, comprising an a heat generating electronic component 44; a thermoelectric module 14; a hot side heat sink 12 mounted on a top of the heat sink 12; and a vapor chamber 16 between the electronic component 44 and the thermoelectric module 14; and a fluid in the vapor chamber, the fluid being evaporated when heat transfers thereto from the microelectronic die and condensing when heat transfers therefrom to the thermoelectric module (see paragraph [0013]). It would have been obvious to one having ordinary skill in the art at the time invention was made to

employ a vapor chamber between the microelectronic die and the thermoelectric module, as it is disclosed by Atkinson, in the device by Meir, in order to enhance heat dissipation from the heat generating microelectronic die.

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Meir as applied to claim 21 above, and further in view of Watanabe (US Patent 6,817,191).

Meir teaches all the limitations of the claims except the computer system of claim 2, further comprising: a hot plate thermally coupled to the thermoelectric module, with the thermoelectric module between the microelectronic die and the hot plate; and a hot-side temperature sensor on a side of the thermoelectric module of the hot plate and opposing the microelectronic chip, the controller being connected to the hot-side temperature sensor to receive an indication of temperature at the hot-side temperature sensor, the controller controlling current provided to the thermoelectric module based on an input from the hot-side temperature sensor. Watanabe teaches a thermoelectrically cooling electronic device, Figs. 1-2, comprising: a hot plate (heat sink) 3 thermally coupled to the thermoelectric module 2, with the thermoelectric module between a cooled component 1 and the hot plate 3; and a hot-side temperature sensor 4 on a side of the thermoelectric module of the hot plate 3 and opposing the cooled component 1, the controller being connected to the hot-side temperature sensor to receive an indication of temperature at the hot-side temperature sensor, the controller controlling current provided to the thermoelectric module based on an input from the hot-side temperature sensor 4. It would have been obvious to one having ordinary skill in the art at the time invention was made to employ a hot-side temperature sensor on a side of

the thermoelectric module of the hot plate and opposing the microelectronic chip, the controller being connected to the hot-side temperature sensor to receive an indication of temperature at the hot-side temperature sensor, the controller controlling current provided to the thermoelectric module based on an input from the hot-side temperature sensor, as Watanabe discloses it in the device by Meir, in order to diversify control of the thermoelectric module.

7. Claims 5, 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meir as applied to claim 21 above, and further in view of Richman (US Patent 4,685,081). Meir teaches all limitations of the claims except the computer system of claim 2, further comprising: a junction temperature sensor within the microelectronic die, the controller being connected to the junction temperature sensor to receive an indication of temperature at the junction temperature sensor, the controller controlling current provided to the thermoelectric module based on an input from the junction temperature sensor. Richman teaches a Peltier junction used for thermal control of solid-state devices comprising a junction temperature sensor 43 within the microelectronic die 21 (col. 3, lines 49-64), the controller 39 being connected to the junction temperature sensor to receive an indication of temperature at the junction temperature sensor, the controller controlling current provided to the thermoelectric module based on an input from the junction temperature sensor 43. It would have been obvious to one having ordinary skill in the art at the time invention was made to employ a junction temperature sensor within the microelectronic die, the controller being connected to the junction temperature sensor to receive an indication of temperature at the junction temperature

sensor, the controller controlling current provided to the thermoelectric module based on an input from the junction temperature sensor in the device by Meir, as Richman discloses it, in order to diversify control of the thermoelectric module.

8. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Meir in view Richman as applied to claim 6 above, and further in view of Palfy et al (US Patent 6,470,696).

Meir in view of Richman teach all limitations of the claim except the computer system of claim 6, further comprising: an ambient moisture sensor detecting ambient moisture of air distant from the microelectronic die and the thermoelectric module, the controller being connected to h the ambient moisture sensor to receive an indication of moisture at the ambient moisture sensor, the controller controlling current provided to the thermoelectric module based on an input from the ambient moisture sensor. Palfy et al teach a thermoelectric cooler for computer/electronic devices comprising an ambient moisture sensor 13 detecting ambient moisture of air distant from the thermoelectric module, the controller 20 being connected to h the ambient moisture sensor 13 to receive an indication of moisture at the ambient moisture sensor, the controller 20 controlling current provided to the thermoelectric module based on an input from the ambient moisture sensor (see Fig. 4). It would have been obvious to one having ordinary skill in the art at the time invention was made to employ an ambient moisture sensor detecting ambient moisture of air distant from the microelectronic die and the thermoelectric module, the controller being connected to h the ambient moisture sensor to receive an indication of moisture at the ambient moisture sensor, the controller

controlling current provided to the thermoelectric module based on an input from the ambient moisture sensor in the device by Meir and Richman, as Palfy et al disclose it, in order to diversify control of the thermoelectric module.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael V. Datskovskiy whose telephone number is (571)272-2040. The examiner can normally be reached on 8:30am-5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jayprakash N. Ganghi can be reached on (571)272-3740. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

04/10/2007

MICHAEL DATSKOVSKIY
PRIMARY EXAMINER

